

CLIMATE AND CROP SERVICE.

By JAMES BERRY, Chief of Climate and Crop Service Division.

The following extracts relating to the general weather conditions in the several States and Territories are taken from the monthly reports of the respective sections of the Climate and Crop Service. The name of the section director is given after each summary.

Snowfall and rainfall are expressed in inches.

Alabama.—The mean temperature was 46.4°, or 0.2° below normal; the highest was 83°, at Healing Springs on the 9th, and the lowest, 12°, at Oneonta on the 25th. The average precipitation was 1.60, or 2.89 below normal; the greatest monthly amount, 4.77, occurred at Healing Springs, and the least, 0.35, at Livingston. The month was generally favorable for all farming operations, and at the close of the month considerable land was prepared for the coming crop, and work on truck farms in the southern counties was well up. There is some complaint of scarcity of water in the north-central portions, but this, however, is of a local character. The rivers were in good navigable condition during the first half of the month, but were barely navigable toward the close.—*F. P. Chaffee.*

Arizona.—The mean temperature was 50.0°, or 3.0° below normal; the highest was 90°, at Tucson on the 23d, and the lowest, 10°, at Fort Apache on the 10th and 11th. The average precipitation was 0.67, or 0.31 above normal; the greatest monthly amount, 1.71, occurred at Signal, while none fell at Russellville.—*W. T. Blythe.*

Arkansas.—The mean temperature was 45.8°, or 2.3° above normal; the highest was 81°, at Texarkana on the 10th, and the lowest, 8°, at Keesees Ferry on the 1st. The average precipitation was 0.84, or 3.81 below normal; the greatest monthly amount, 2.75, occurred at Warren, and the least, 0.15, at Lacrosse.—*F. H. Clarke.*

California.—The mean temperature was 50.1°, or 2.8° below normal; the highest was 92°, at Downey and Pomona on the 3d, and the lowest, 1°, at Bodie on the 31st. The average precipitation was 3.47, or 0.94 below normal; the greatest monthly amount, 17.23, occurred at Delta, while none fell at Beaumont, Indio, Mammoth Tank, and Palm Springs.—*J. A. Barwick.*

Colorado.—The mean temperature was 29.7°, or 3.7° above normal; the highest was 74°, at Pueblo on the 22d, and the lowest, 20° below zero, at Gunnison on the 22d. The average precipitation was 0.59, or about one-half the normal; the greatest monthly amount, 4.95, occurred at Santa Clara, while none fell at St. Cloud.—*F. H. Brandenburg.*

Florida.—The mean temperature was 57.9°, or 3.6° below normal; the highest was 86°, at Lemon City on the 9th and 10th, and the lowest, 26°, at De Funiak Springs on the 25th. The average precipitation was 2.14, or 0.67 below normal; the greatest monthly amount, 5.70, occurred at Tallahassee, and the least, 0.50, at Oxford. The month presents no marked departures from normal conditions. It was favorable for farm work, and winter truck interests made good progress. Some growers banked with dirt for the winter. Only over northern districts were frosts of sufficient severity to cause apprehension. During the latter part of the third decade frost was observed over the northern portion of the north-central district; no serious damage resulted.—*A. J. Mitchell.*

Georgia.—The mean temperature was 46.0°, or 1.0° below normal; the highest was 81°, at Hawkinsville on the 1st and 2d, and the lowest, 9°, at Clayton, on the 26th. The average precipitation was 3.36, or 3.88 below normal; the greatest monthly amount, 7.62, occurred at Fleming, and the least, 0.33, at Ramsey.

Idaho.—The mean temperature was 31.0°; the highest was 63°, at Mindoka on the 13th, and the lowest, 10° below zero, at Roseberry on the 21st. The average precipitation was 1.75; the greatest monthly amount 4.94, occurred at Fort Sherman, and the least, 0.20, at Martin.—*D. P. McCallum.*

Illinois.—The mean temperature was 34.7°, or 5.0° above normal; the highest was 70°, at Cairo on the 12th, and the lowest, 4° below zero, at Scales Mound on the 19th. The average precipitation was 0.53 or 1.92 below normal; the greatest monthly amount, 1.41, occurred at Martinsville, and the least, "trace," at Minonk.—*C. E. Linney.*

Indiana.—The mean temperature was 35.2°, or 1.9°, above normal; the highest was 68°, at Evansville on the 12th, and the lowest, 9° below zero, at Auburn on the 24th. The average precipitation was 1.29, or 1.51 below normal; the greatest monthly amount, 2.21, occurred at Jeffersonville, and the least, 0.37 at South Bend.—*C. F. R. Wappenhans.*

Iowa.—The mean temperature was 30.8°, or 7.0° above normal; the highest was 70°, at Belknap on the 5th, 8th, and 10th, and the lowest, 10° below zero, at Rock Rapids on the 1st. The average precipitation was 0.65, or 1.00 below normal; the greatest monthly amount, 1.79, occurred at Dows, and the least, "trace," at Denison.—*G. M. Chappel.*

Kansas.—The mean temperature was 39.6°, or 5.0° above normal; the

highest was 78°, at Hutchinson on the 22d, and the lowest, 4°, at Phillipsburg and Pratt on the 1st. The average precipitation was 0.44, or 0.44 below normal; the greatest monthly amount, 2.60, occurred at Fort Riley, while none fell at Morland and Norton.—*T. B. Jennings.*

Kentucky.—The mean temperature was 39.6°, or 0.4° above normal; the highest was 73°, at Russellville on the 30th, and the lowest, 7°, at Ashland on the 25th. The average precipitation was 1.82, or 1.68 below normal; the greatest monthly amount, 3.36, occurred at South Fork, and the least, 0.49, at Middlesboro. Taken as a whole December was a fine winter month, the weather being generally fair throughout, and the temperature comparatively mild. The only heavy rainfall occurred about the 8th, but it was sufficient to thoroughly moisten the soil and nurture winter wheat, which was reported to be in excellent condition. The temperature did not continue low enough during the prevalence of the two cold waves, which were central on the 1st and 25th, to freeze the soil except a mere coating at the surface. Hence, wheat did not suffer from any severe cold, even though there was no snow on the ground during these periods of low temperature. Pastures were never better in midwinter, except in December, 1894, and January, 1895.—*Frank Burke.*

Louisiana.—The mean temperature was 51.7°, or 2.2° below normal; the highest was 82°, at Abbeville on the 8th, and the lowest, 16°, at Robeline on the 18th. The average precipitation was 2.09, or 1.44 below normal; the greatest monthly amount, 4.57, occurred at Sugar Experiment Station, Audubon Park, and the least, 0.33, at Calhoun. December, 1896, favored the farmers and planters of Louisiana, the month being dry, permitting the marketing of the several crops harvested, and it was also a particularly favorable month to the sugar planters, giving but little bad weather and no severe cold to injure the cane crop. The grinding season was practically closed before the close of December, although some planters have some cane standing at date, and there is also some in windrow to be ground. These cases are, however, the exception. The severe drought and unusually warm weather during the past season made planters anticipate a rather short sugar yield, but it is gratifying to learn that the State is turning out one of the largest sugar yields ever made in one season. The loss to cane from freezing weather was immaterial, and a considerable amount of windrowing was done as a precautionary measure against severe cold. Some cane has already been planted, and plowing is progressing in various portions of the sugar belt.—*R. E. Kerkam.*

Maryland.—The mean temperature was 34.3°, or 2.0° below normal; the highest was 70°, at Charlotte Hall on the 7th, and the lowest, 2° below zero, at Sunnyside on the 28th. The average precipitation was 0.86, or 1.56 below normal; the greatest monthly amount, 2.71, occurred at Sunnyside, and the least, 0.11, at Johns Hopkins Hospital.—*G. E. Hunt.*

Michigan.—The mean temperature was 26.9°, or 1.4° below normal; the highest was 60°, at Hanover, Clinton, Grape, and Berrien Springs on the 12th, and the lowest, 23° below zero, at Thomaston on the 1st. The average precipitation was 0.95, or 1.61 below normal; the greatest monthly amount, 2.23, occurred at Wetmore, and the least, 0.22, at Stanton. The precipitation is by far the least average total for any December during the past ten years.—*C. F. Schneider.*

Minnesota.—The mean temperature was 20.3°, or 3.2° above normal; the highest was 52°, at Mazeppa on the 12th, and the lowest, 51° below zero, at Pokegama on the 1st. The average precipitation was 0.61, or 0.25 below normal; the greatest monthly amount, 1.79, occurred at Mount Iron, and the least, "trace," at St. Cloud.—*T. S. Outram.*

Mississippi.—The mean temperature was 48.8°, or 1.3° above normal; the highest was 88°, at French Camp on the 8th, and the lowest, 16°, at Austin on the 25th. The average precipitation was 1.29, or 3.84 below normal; the greatest monthly amount, 4.57, occurred at Magnolia, and the least, "trace," at Kosciusko. No precipitation was reported from Hazelhurst and Columbus.—*R. J. Hyatt.*

Missouri.—The mean temperature was 38.7°, or 4.8° above normal; the highest was 79°, at Gorin on the 30th, and the lowest, 5° below zero, at Maryville on the 1st. The average precipitation was 0.94, or 1.06 below normal; the greatest monthly amount, 3.90, occurred at Osceola, and the least, 0.02, at Maryville and St. Joseph. The month was remarkably favorable for outdoor work, and throughout the greater portion of the State plowing could be done on nearly every day, but the deficient precipitation and almost total absence of snow was injurious to winter wheat, which suffered considerably from the severe freeze at the close of November.—*A. E. Hackett.*

Montana.—The mean temperature was 33.0°, or 10.0° above normal; the highest was 75°, at Billings on the 30th, and the lowest, 24° below zero, at Glasgow and Poplar on the 1st. The average precipitation was 0.34, or 0.29 below normal; the greatest monthly amount, 3.49, occurred at Troy; none fell at five stations. The weather during the month was remarkably mild and pleasant, and with the exception of a cold

wave on the 1st and 2d no cold weather occurred, and temperatures below zero after the above dates were almost unknown. The extreme cold weather in November was the cause of much anxiety among the cattle and sheep owners, and the early portion of December showed no signs of improvement, but at the end of the month all stock on the ranges had regained in flesh what they had lost during the cold weather and snows of the previous month. Hunters report that hibernating animals, such as bear, badger, and ground hog have abandoned their winter quarters, and their appearance at this early date is looked upon by old timers as a sure sign that the backbone of winter is broken.—*R. M. Crawford.*

Nebraska.—The mean temperature was 34.0°, or 8.4° above normal; the highest was 70°, at Aurora on the 10th and at Curtis on 22d, and the lowest, 10° below zero, at Hartington on the 1st. The average precipitation was 0.23, or 0.46 below normal; the greatest monthly amount, 0.90, occurred at Rulo, while none fell at several stations. Fog was general and dense on the last three days of the month in the southern and eastern portions of the State. This, with the high temperature, caused the month to close with the frost practically out of the ground in much of the southeastern portion of the State.—*G. A. Loveland.*

Nevada.—The mean temperature was 34.5°, or 4.6° above normal; the highest was 73°, at Candelaria on the 3d, and the lowest, 10° below zero, at Stofiel on the 7th. The average precipitation was 0.40, or 1.01 below normal; the greatest monthly amount, 2.11, occurred at Lewers Ranch; no rain or snow fell at St. Clair, and several stations report only "traces." The month was unusually mild.—*R. F. Young.*

New England.—The mean temperature was 24.6°, the highest was 59°, at Cambridge, Mass., on the 13th, and the lowest, 21° below zero, at Flagstaff, Me., on the 23d. The precipitation was greatly below the normal in all parts of the district, except the southern Massachusetts coast, where the totals varied little from the average; the greatest monthly amount, 3.67, occurred at Long Plain, Mass., and the least, 0.45, at Enosburg Falls, Vt.—*J. W. Smith.*

New Jersey.—The mean temperature was 31.3°, or 1.2° below normal; the highest was 64°, at Moorestown on the 7th and at Barnegat on the 10th, and the lowest, 15° below zero, at River Vale. The average precipitation was 1.43, or 2.20 below normal; the greatest monthly amount, 2.70, occurred at River Vale, and the least, 0.85, at Barnegat. Winter grain and grass were well protected by snow during the severe cold spell, 16th to 29th.—*E. W. McGann.*

New Mexico.—The highest temperature was 76°, at Clayton on the 22d, and the lowest, 1°, at Monero on the 1st and at Buckmans on the 17th. The greatest monthly precipitation was 3.25 at Albert, while none fell at Deming.—*H. B. Hersey.*

New York.—The mean temperature was 26.3°, or 1.9° below normal; the highest was 69°, at Waverly on the 6th, and the lowest, 20° below zero, at North Lok on the 22d, Wappingers Falls on the 25th, and Saranac Lake on the 26th. The average precipitation was 1.36, or 1.49 below normal; the greatest monthly amount, 3.82, occurred at Demster, and the least, 0.35, at Eagle Mills.—*R. M. Harding.*

North Carolina.—The mean temperature was 40.6°, or 2.2° below normal; the highest was 73°, at Soapstone Mount on the 10th, and the lowest, 4°, at Highlands on the 25th. The average precipitation was 2.51, or 1.31 below normal; the greatest monthly amount, 5.77, occurred at Beaufort, and the least, 0.58, at Saxon. Excepting the storms on the 2d and 15th, the weather during the month was remarkably pleasant. The snowstorm on the 2d covered the ground to an average depth of five inches.—*C. F. von Herrmann.*

North Dakota.—The mean temperature was 16.4°; the highest was 53°, at Oakdale on the 10th and 11th, and the lowest, 35° below zero, at McKinney on the 2d. The average precipitation was 0.37, or 0.33 below normal; the greatest monthly amount, 1.60, occurred at Sheyenne, and the least "trace," at White Earth.—*B. H. Bronson.*

Ohio.—The mean temperature was 32.9°, or 0.2° above normal; the highest was 67° at Portsmouth on the 12th, and the lowest, 15° below zero, at Benton Ridge on the 24th. The average precipitation was 1.65, or 0.88 below normal; the greatest monthly amount, 3.85, occurred at Rittman, and the least, 0.43, at Frankfort. The alternate freezing and thawing weather and lack of continued snow protection hurt wheat. A fairly good month for prosecution of farm work.—*H. W. Richardson.*

Oklahoma.—The mean temperature was 44.4°, or 5.0° above normal; the highest was 87°, at Fort Reno on the 12th, and the lowest, 8°, at Healdton on the 1st. The average precipitation was 1.24, or 1.20 below normal; the greatest monthly amount, 3.55, occurred at Mangum, while none fell at South McAlistier. The month was remarkably mild and pleasant, being the warmest December for which there is a record; not a norther or blizzard occurred. The mean temperature for the year was 61.7°, or 2.7° above the yearly normal. The average precipitation was 24.00, or 9.29 below normal.—*Jas. S. Widmeyer.*

Oregon.—The mean temperature was 42.6°, or 3.9° above normal; the highest was 66°, at Bay City on the 15th, and the lowest, 8°, at Burns on the 21st. The average precipitation was 8.58, or 2.30 above normal; the greatest monthly amount, 30.05, occurred at Glenora, and the least, 0.60, at Burns. Though very rainy, the weather during December was less stormy than usual; there was an almost complete absence of injurious frosts.—*B. S. Pague.*

Pennsylvania.—The mean temperature was 30.6°, or 2.4° below normal;

the highest was 67°, at Indiana on the 10th and Cannonsburg and Irwin on the 13th, and the lowest, 13° below zero, at Dyberry on the 28th. The average precipitation was 1.20, or 2.12 below normal; the greatest monthly amount, 2.62, occurred at Somerset, and the least, 0.40, at Harrisburg and Reading.—*T. F. Townsend.*

South Carolina.—The mean temperature was 44.0°, or 4.3° below normal; the highest was 83°, at Trial on the 8th and 11th, and the lowest, 8°, at Santuc on the 5th. The average precipitation was 3.55, or 0.41 above normal; the greatest monthly amount, 6.46, occurred at St. George, and the least, 0.55, at Walhalla. The month began with a sleet storm over the entire State, followed by snow over all but the southeastern third of the State. In the central belt of counties the sleet storm was destructive to trees, telegraph and telephone poles and wires. The weight of the accumulated ice and snow on the branches of trees broke many of them, and even whole trees were broken down by the weight. Telegraphic and telephonic communication was completely interrupted for some time, until repairs could be made. The rainfall averaged 113 per cent of the usual December amount, due to an excess over the coast, or lower counties generally, and a deficiency over the western counties, while over the central counties the rainfall varied little from the normal.—*J. W. Bauer.*

South Dakota.—The mean temperature was 26.0°, or about 5.0° above normal; the highest was 70°, at Rapid City on the 9th, and the lowest, 23° below zero, at Webster on the 1st. The average precipitation was 0.17, or 0.43 below normal; the greatest monthly amount, 0.99, occurred at Webster, while none fell at several stations. The month as a whole was a very pleasant one, comparatively; in point of temperature, was less a winter month than November and was much more pleasant than many other Decembers of which there is reliable record. It was unusually free from disagreeable and stormy weather. Reports from the ranges indicate that there was little or no snow to interfere with the grazing of stock and that all range interests are in good condition.—*S. W. Glenn.*

Tennessee.—The mean temperature was 40.8°, or 0.4° below normal; the highest was 73° at Memphis on the 11th and Waynesboro on the 13th, and the lowest, 6°, at Rugby on the 25th. The average precipitation was 1.36, or 2.27 below normal; the greatest monthly amount, 3.89, occurred at Nunnally, and the least, 0.22, at Rugby. The month was characterized by large excess of clear weather and less than one-half the usual number of days with .01 or more of an inch of rainfall, and while conditions were highly favorable to agricultural interests they were detrimental to other business and the general health of animal life.—*H. C. Bate.*

Texas.—The mean temperature was 1.5° below normal; there was a general deficiency throughout the State except over the Panhandle, west and central Texas, and the western portion of north Texas, where there was an excess ranging from 1.8° to 7.0°, with the greatest over the Panhandle. The deficiency ranged from normal to 6.3° below over the coast district and southwest Texas, and from 1.5° to 6.8° over the eastern portion of north Texas and over east Texas, with the greatest deficit in the vicinity of Huntsville. The highest was 92°, at Camp Eagle Pass on the 14th, and the lowest, 9°, at Graham on the 1st. The average precipitation was 0.38 below normal. The precipitation was generally in the form of rain, and was not well distributed throughout the State. There was comparatively none during the first and second decades of the month, except scattering showers on the 7th and 8th over the southeastern portion of the State, but general showers, with good local rains, occurred just at the close of the month. On an average the precipitation for the month was above the normal over the Panhandle, the western portion of north Texas, central Texas, and the central portion of the coast district, while there was a general deficiency over the other portions of the State. The greatest monthly amount, 5.67, occurred at Houston, and the least, 0.05, at Sanderson.

The dry weather during the first and second decades of December was exceptionally favorable for farming operations, and much work was done. Toward the close of the month the ground was getting rather dry for winter plowing, and this work was retarded to some extent. The showers with local rains in some sections at the close of the month were generally needed, and were very beneficial for all farming interests. It is reported from north Texas that more plowing is being done than usual, and farm work as a rule is well advanced.

Winter wheat continued to do fairly well during the early part of the month, except that the severe cold weather at the close of November and at the opening of December injured the plant slightly in a few localities. The dry weather was causing the crop to suffer from want of rain, and the showers over the wheat belt at the close of the month were exceptionally beneficial to the crop, and will improve its condition generally. The plant has a healthy appearance, and the prospects for a good crop are promising.

Winter and volunteer oats were damaged slightly by the cold weather, and the crop suffered slightly for want of rain before the showers occurred toward the close of the month; otherwise the crop continues doing well.—*I. M. Cline.*

Utah.—The mean temperature was 31.0°, or about 4.0° above normal; the highest was 66°, at Fillmore on the 27th, and the lowest, 3° below zero, at Kousharen on the 1st. The average precipitation was 0.46, or about one-half the normal; the greatest monthly amount, 1.41, occurred

at Brigham City, and the least, "trace," at Giles and Mammoth. Upon the whole, the weather conditions were exceptionally fine for farm work, but very detrimental to stock interests.—*J. H. Smith.*

Virginia.—The mean temperature was 36.9°, or 3.1° below normal; the highest was 86°, at Stanleyton on the 8th, and the lowest, 2°, at Dale Enterprise. The average precipitation was 1.02, or 2.59 below normal; the greatest monthly amount, 4.04, occurred at Hampton, and the least, "trace," at several stations.—*E. A. Evans.*

Washington.—The mean temperature was 40.0°, or 2.3° above normal; the highest was 65°, at Sedro on the 8th and 9th and Kennewick on the 9th, and the lowest, 5°, at Loomis on the 1st. The average precipitation was 7.97, or 1.37 above normal; the greatest monthly amount, 26.26, occurred at Clearwater, and the least, 1.14, at Moxee.—*G. N. Salisbury.*

West Virginia.—The mean temperature was 35.0°, or about normal; the highest was 67°, at Old Fields on the 13th, and the lowest, 2° below zero, at Marlinton on the 25th. The average precipitation was 1.68,

or 1.50 below normal; the greatest monthly amount, 2.88, occurred at Beverly, and the least, 0.57, at Romney. Very little snow fell in the Ohio Valley and its larger tributaries. In the mountains the total depth at some stations ranged from 4 to 8 inches. It was generally moist in character and soon disappeared. The weather on the whole was beneficial to the winter wheat, and at the close of the month this crop was in good condition and promising.—*H. L. Ball.*

Wisconsin.—The mean temperature was 28.6°, or 2.0° above normal; the highest was 62°, at Delavan on the 29th, and the lowest, 20° below zero, at Spooner on the 1st. The average precipitation was 0.84; the greatest monthly amount, 2.44, occurred at Hayward, and the least, 0.05, at Chilton.—*W. M. Wilson.*

Wyoming.—The mean temperature was 32.1°; the highest was 70°, at Fort Laramie on the 11th, and the lowest, 13° below zero, at Fort Washakie. The average precipitation was 0.10; the greatest monthly amount, 0.46, occurred at Fort Yellowstone, while none fell at Fort Laramie, Fort Washakie, and Wise.—*M. G. Renoe.*

RIVER AND FLOOD SERVICE.

By PARK MORRILL, Forecast Official, in charge of River and Flood Service.

The extreme and average stages of water in the rivers for the current month are given in Table VIII. In no case have the rivers reached dangerous heights. At the close of the month navigation on the upper Mississippi and the Missouri was practically suspended. The latter river was frozen north of Sioux City. The Ohio and lower Mississippi were navigable throughout the month. The rivers of the Atlantic Coast and the South have been at low stages.

The following résumé of river stages and conditions of navigation in the various streams is compiled from reports by the following officials of the Weather Bureau at various river stations and section centers:

A. F. Sims, Observer, Albany, N. Y.; E. R. Demain, Observer, Harrisburg, Pa.; E. A. Evans, Local Forecast Official, Richmond, Va.; C. F. von Herrmann, Observer, Raleigh, N. C.; L. N. Jesunofsky, Local Forecast Official, Charleston, S. C.; David Fisher, Observer, Augusta, Ga.; J. B. Marbury, Local Forecast Official, Atlanta, Ga.; W. M. Dudley, Observer, Mobile, Ala.; F. P. Chaffee, Local Forecast Official, Montgomery, Ala.; S. S. Bassler, Local Forecast Official, Cincinnati, Ohio; Frank Ridgway, Local Forecast Official, Pittsburgh, Pa.; H. L. Ball, Observer, Parkersburg, W. Va.; L. M. Pindell, Observer, Chattanooga, Tenn.; F. J. Walz, Local Forecast Official, Davenport, Iowa; H. C. Frankfield, Local Forecast Official, St. Louis, Mo.; S. C. Emery, Observer, Memphis, Tenn.; R. J. Hyatt, Local Forecast Official, Vicksburg, Miss.; R. E. Kerkam, Local Forecast Official, New Orleans, La.; L. A. Welsh, Local Forecast Official, Omaha, Nebr.; Patrick Connor, Local Forecast Official, Kansas City, Mo.; F. H. Clarke, Local Forecast Official, Little Rock, Ark.; W. H. Hammon, Forecast Official, San Francisco, Cal.

Hudson River.—On the 4th much anchor ice formed in the river, but the mild conditions of the 6th caused all the ice to disappear from both river and basin. On the 16th anchor ice again appeared in the river. The prevalent northerly wind kept the water in the Hudson below the normal level and rendered navigation difficult from Van Wines Point to Troy. The People's Line sent their last boat south on the evening of the 16th. The steamer *City of Troy* left for New York City on the 17th, the last south bound boat of the season from the head of tidewater navigation. Half-inch ice covered the Albany basin on the 17th, and had thickened to 3 inches by the 19th. On the morning of the 20th the Hudson River was frozen over from Troy to Hudson, and the ice men took advantage of the situation and began the work of staking out ice claims. The high west and northwest winds filled the ice with dust particles, which will detract somewhat from what would otherwise be considered a perfect ice formation in the Albany district. At the close of the month an average of 4 inches of snow covered the Hudson and Mohawk watersheds; the ice in the Mohawk averaged 13 inches in thickness at Schenectady and that in the Hudson ranged from 7 inches at the State dam to 2 inches at Newberg.

Susquehanna River and branches.—Notwithstanding the fact that the precipitation over the drainage area of the Susquehanna River and its

tributaries was very light, probably less than during any December since observations began, the streams maintained about the average stages of water for the time of year. At Harrisburg the river averaged 0.4 of a foot higher than in December, 1895, although the rainfall was only about 12 per cent of the amount reported for December, 1895, being the least (only 0.40 inch) for any December since the Weather Bureau station was opened. On the West Branch and the Juniata the rainfall was heavier, averaging about 1 inch. The West Branch was reported closed at Farrandville during the entire month. It closed at Renova on the 24th and at Keating on the 25th. The Juniata was closed at Mifflin from the 3d to the 8th and from the 24th to the close of the month. The Susquehanna did not freeze over at Harrisburg, but there was ice along its banks, from the 24th to the 29th, sufficient for skating. It closed between Columbia and Wrightsville, about 60 miles below Harrisburg, on Christmas night, and on December 28 the ice was 5 to 6 inches thick, and persons were able to cross on foot. It was still closed at the end of the month, although probably not safe for crossing at that time on account of the milder weather.

Rivers of the South Atlantic States.—The rainfall in the valley of the James was light, and as a consequence the river remained low. There were no perceptible rises attendant upon any of the rains which fell. In the upper valley there was a steady fall of the river during the entire month, with the exception of the 7th and 29th, when slight rises occurred. The close of the month found the river in its normal condition as to purity and height for the time of year.

The rivers of North Carolina were uniformly low, though somewhat higher than during November. Slightly higher stages prevailed from the 2d to 5th, 8th to 11th, and 17th and 18th, but in no case approached the danger lines. The lowest stages were attained toward the end of the month.

The heavy rainfall in South Carolina on the 1st and 2d was mostly confined to the coast region, and in consequence there were no freshets of marked severity. The rains were followed early on the morning of the 2d at points within 50 miles of the coast by an ice storm covering everything with a coating of ice one-half inch to one and one-quarter inches thick, which prostrated many trees and caused much damage to the telegraph poles and wires. Snowfall measuring 3 to 8 inches occurred over the central portion of the State on the 2d. It melted slowly during the 3d to 6th, and had but little effect upon the streams in that section. Thin and running ice was observed in the Wateree at Camden and in the Great Pee Dee at Cheraw on the 3d to 5th and the 24th to 26th.

The Great Pee Dee was navigable up to Cheraw until the 23d. The Congaree was at a low stage during the last half of the month. Many cotton factories located on the Saluda and Broad rivers were running from the 1st to the 16th; after that date they were shut down again on account of the lack of water. The Waccamaw remained at a navigable stage from Winyah Bay to Waccamaw during the entire month. Navigation was uninterrupted on the Santee and Wateree between St. Stephens and Camden during the month. More merchandise was shipped at Charleston and Georgetown over the various streams than for many months past.

Two rises occurred in the Savannah River during the month, the first culminating on the 3d and the other on the 16th. No better conditions could be desired for navigation than have prevailed, the boats making regular trips with fairly good cargoes, cotton forming the chief commodity now in transportation.

Other Georgia rivers, low at the beginning of the month, continued so to its end. There were no sudden rises and the changes were but slight from day to day.

Mobile River and branches.—The Mobile River and its tributaries have,